Architectural
CONCRETE

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Architect's Studio—in Concrete

By Hoke Smith, Architect*

OUR studio-workshop on the outskirts of Dallas is a $50,000 investment and a strong vote of confidence n the future of architectural concrete in the state of Texas. This building is a prime example of our design product and an indication of the kind of material we prefer to work with, aside from very comfortably sheltering the 30 workers which comprise our organization. The success of this project means that we intend to use concrete extensively in our work from now on.

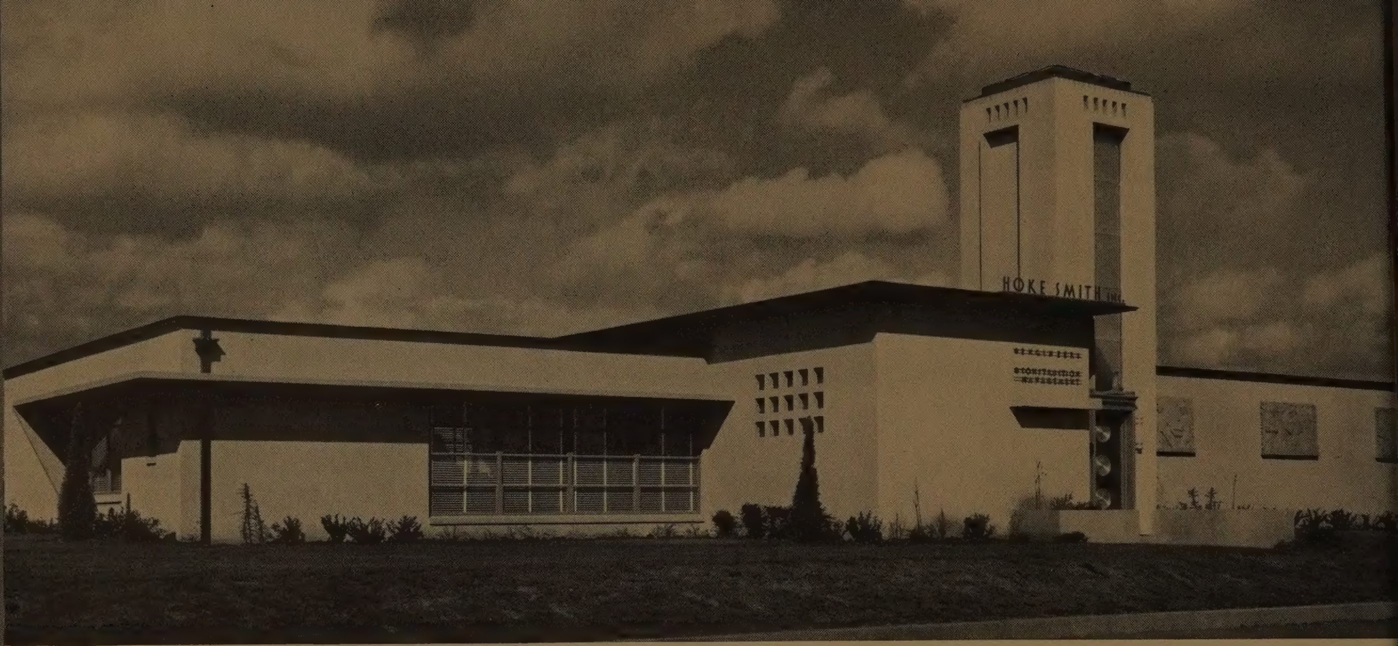
Several objectives were accomplished in building this studio. One was a reduction in overhead made possible by working in our own building instead of renting the large amount of space required for our organization. Another was to effect an efficient arrangement of offices and workrooms that is rarely possible to find in available office space. A third was to combine our architectural, engineering and construction departments in one location, which is only possible where yard space is available. A fourth reason for the structure was a desire to have a complete building as an exhibit of what can be done with modern materials. Last, and very important, the design and construction of this building gave us an opportunity to develop our technique in the use of concrete, to work out little construction "bugs", and thus add proof and assurance to our recommendation of concrete for Texas buildings.


Stenographic department opens onto the main lobby of the studio.

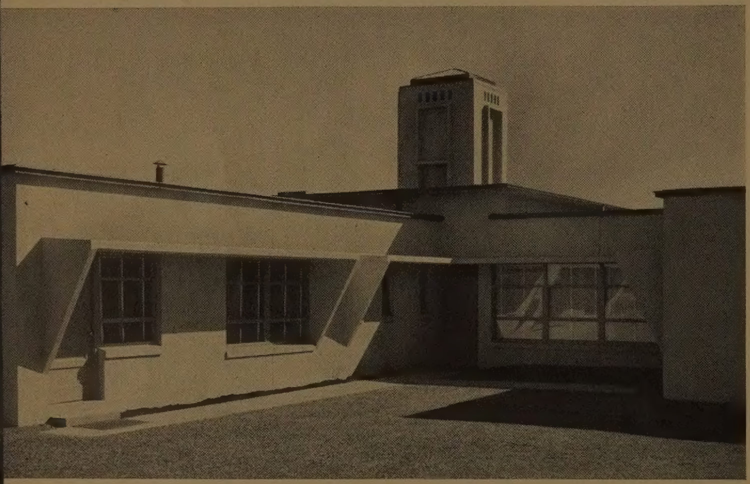
The location of the building well outside the city of Dallas was not alone because of economy or because we like wide open spaces. It was for the comfort of our clients who are not generally city people, but school district trustees from all over the state. Visiting our studio they avoid unfamiliar city traffic congestion, and have no worries about their cars in parking lots or in limited-time parking areas in city streets.

The plan reveals the building to be a series of wings reaching out for maximum natural illumination. One wing, extending right from the entrance, is the drafting room with boards for ten workers and a fireproof file for plans. This

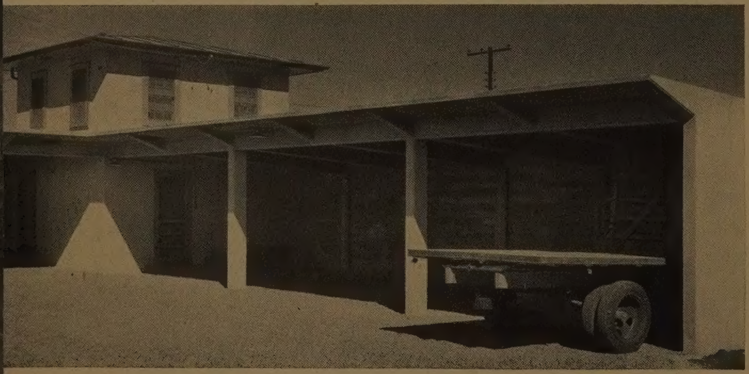
*Dallas, Texas.



The architectural, engineering and construction staffs of Hoke Smith, Inc., collaborated in the design and erection of this studio near Dallas, Texas. It is entirely of architectural concrete—a splendid example for clients.



Permanent concrete canopies give shade to rear windows opening onto workrooms, cut down summer air-condition costs.



A storage shed at the rear is also of concrete. The two-story portion is the janitor's quarters.

room is lighted by a solid glazed north wall and by fluorescent overheads in a long, double trough. Other wings contain stenographic department, estimators' room, blueprint room, general office, president's office and conference room.

Instead of awnings there are permanent concrete canopies overhanging all rear windows. These prevent direct sunlight from entering, keep the building cool and make the all-year air conditioning cost less in summer.

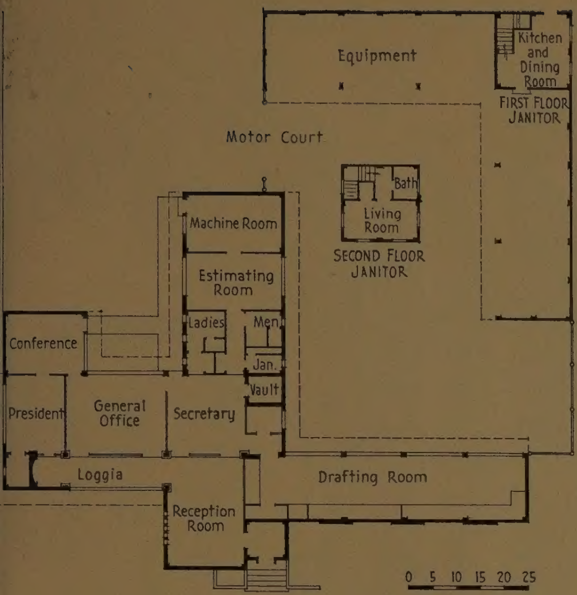
Forms for the structure were erected all at one time using ¾-in. plywood. Control joints were used in all walls, a narrow line being the only evidence of these devices. These lines fit into the exterior design.

One bit of unusual construction procedure which worked out most successfully was casting all walls in one continuous operation. This required 17½ hours from footings to copings. Within 24 hours after concreting, forms were stripped and the first carborundum rubbing commenced. This initial rubbing required three days, after which the final rubbing was started. This was done over a longer period.

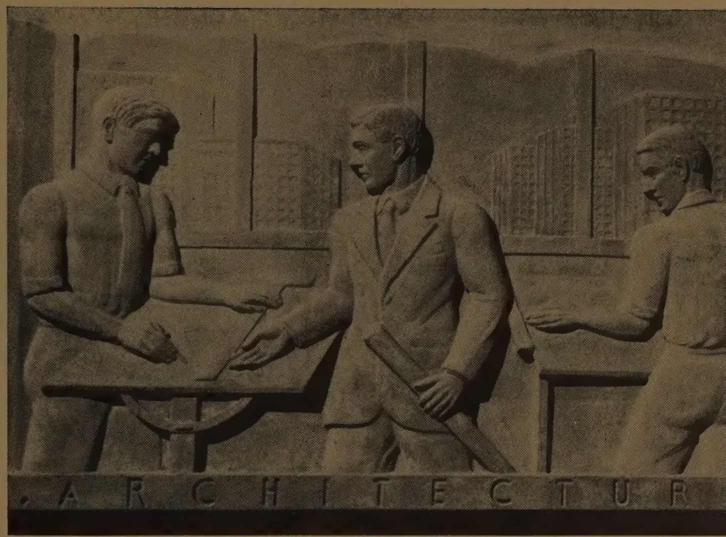
Walls of the building are 8 in. thick, furred with Celotex plaster board and plastered. Floors are 5 in. thick and the roof slab 4 in. thick.

On the front wall of the right wing are three plaques made in plaster molds modeled by Jose Martin, well known, international sculptor. These plaques symbolize architecture, engineering and construction—the three departments of our organization. These ornaments stripped beautifully from the molds.

At the rear of the main building is a 12-car open end garage in the shape of an L. At the apex of the L is a two-



Plan of the studio building.



One of three sculptured plaques on the right wing of the main facade. Other two symbolize engineering and construction.

ory square portion which is occupied by the janitor and is family. The garage structure is entirely concrete also ith 4-in. walls and 8-in. columns and 4-in. roof slab. The rea enclosed by the main building and the garage is the quipment and materials storage yard.

Design and construction of the building were carried out ntirely by members of our organization and naturally we re very proud of the results obtained.

The building, since completion, has attracted considerble attention especially among people unfamiliar with rchitectural concrete. Some of them have asked: "Smith, ou must expect to be in business for a thousand years in his studio, building it out of concrete this way." Well, I now *I* won't be; but I have two sons who are architects or ngineers or are in school learning these arts and crafts, nd they may have sons who like the same business. It could ell house this business a thousand years. I hope it does.

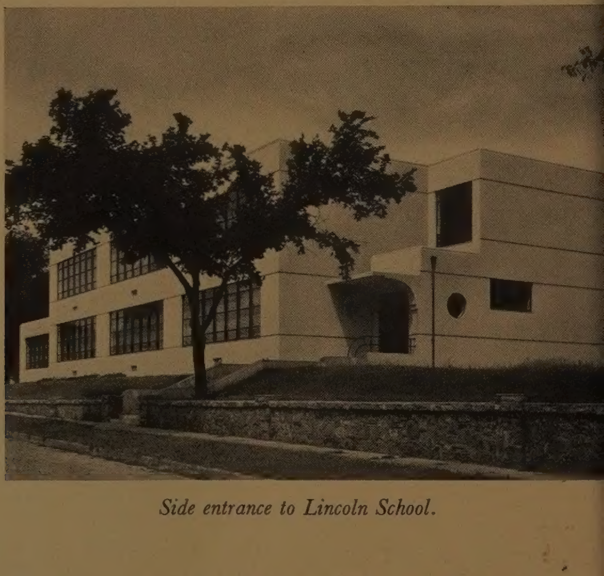
General office with president's office at rear.

)raftsmen's dream of a place to work —ten boards with north light and uorescent overheads.

Main facade of Lincoln School, one of two new concrete buildings erected for Iola, Kan., to replace five obsolete schools. Both buildings were designed by Lorentz Schmidt, architect. Godfrey Hartwell of Wichita, structural engineer; Huff Construction Co., Pittsburg, Kan., contractor.

Two Schools for Iola, Kansas

BY LORENTZ SCHMIDT, ARCHITECT*



Side entrance to Lincoln School.

PRIOR to 1939 there were five grade schools in Iola, Kan., all of them old and in poor condition. The problem confronting the board of education was whether to rebuild the old schools or attempt some kind of consolidation. Fortunately, the locations of Lincoln and Jefferson schools were so centralized that if adequate buildings were erected, the entire city could be served. It was decided, therefore, to raze all the old buildings and erect two new structures—one to be Jefferson School and the other Lincoln School.

There were no unusual conditions to meet in either of the

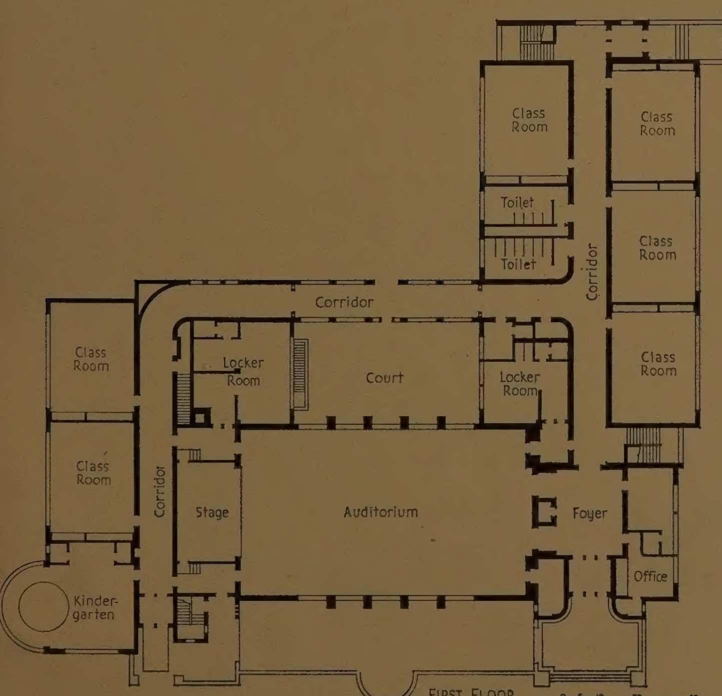
*Wichita, Kan.

wo buildings as far as normal grade school ıse was concerned. But it was thought proper to design buildings of modern appearance with a maximum of natural illumination, and with as many rooms at ground evel as possible. Since the site of each building was ample, rambling floor arrangements were possible; and to achieve he modern style with the large number of openings, it was decided to use architectural concrete.

In view of the good soil conditions at both sites, foundations of the buildings consist of spot footings and heavy grade beams. The first floors are framed throughout, it being felt that this provided a more satisfactory structure than the more common practice of slabs on grade. This type of construction, furthermore, provided unrestricted space for duct work and piping.

The use of long window openings and high window heads created a design problem since the spandrel beams from window head to floor line did not provide sufficient depth to take the relatively large moments from the floors. The alternatives were: dropping the window heads and shortening the window openings, or using inverted beams in which the concrete could be placed from window head to the window

Large, smooth areas formed against plywood and simple molded ornament characterize the designs of both buildings. One of west front entrances of Lincoln School.



(*Left*) *First floor plan—Lincoln School.*

sills of the next floor above. The latter was chosen because it did not require changes in the architectural design, and because it eliminated construction joints at floor levels and roof line.

It was thought at first that the inverted beams would prove difficult in construction. Actually, however, the contractor encountered no difficulties, and it is now felt that inverted beams in certain types of buildings might even offer construction advantages.

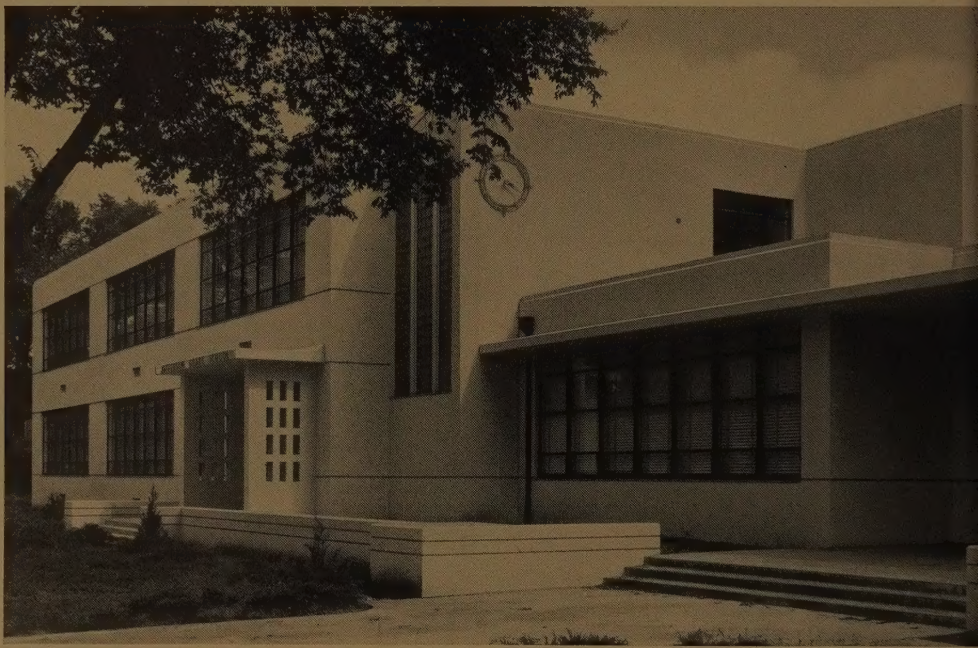
Exterior walls throughout both buildings are 10 in. thick above the first floor

line, reinforced vertically and horizontally in both wall faces. Expansion joints in the buildings, due to their great length, were considered essential and particular care was taken in choosing their locations. Practically all of the expansion joints are located at inside corners of the buildings where they are quite inconspicuous. These joints are of the bellows type using 16-oz. sheet copper dams and 1-in. premolded joint filler.

Plywood forms were used, and no rubbing was done after forms were stripped. Before completion of the buildings, however, the exterior walls were given a prime coat and two coats of an oil base portland cement paint. The finish color of the buildings is light buff which is in pleasing contrast with the many trees surrounding them on all sides.

No interior furring was used in either building. Exterior walls of classrooms and utility rooms were plastered directly on the concrete which was first given two coats of asphaltic plaster bond. To date there has been no evidence of moisture in any of the walls.

The two buildings contain a total of 24 classrooms, and each has an auditorium-gymnasium providing ample space for current use and some future expansion. Work on both buildings commenced in January, 1939 and was completed in the early spring of 1940. The cost of the two buildings, $240,000, was defrayed by a local bond issue and a 45 per cent PWA grant.



Main facade of Jefferson School. Walls were given two coats of buff tinted portland cement paint, applied after the walls had been thoroughly cleaned.

Because the sites of both buildings were ample, floor plans were permitted to ramble freely over the area with most of the classrooms confined to ground floor level. This is a rear view of Jefferson School.

The municipal building at New York Mills, Minn., designed by Foss & Co., architects and engineers, combines city hall, fire station and store. It is of modern design with horizontally fluted spandrels and copings. Built by WPA.

Concrete Above the 46th Parallel

By M. O. Foss*

SOME people believe, because they have heard Paul Bunyan stories, that there is only one month of "poor eighing" in northern Minnesota, and that one winter it was o cold the snow was blue. This is not quite true (although here are several months a year when you shouldn't go out without your mittens) for there are usually several weeks in the summer when the thermometer bubbles up around 100 plus.

Minnesota has the third largest range of temperatures of any state in the Union, and any material that requires freezing and thawing tests to prove it, can get those tests up

Member, Foss & Co., architects and engineers, Fergus Falls, Minn.

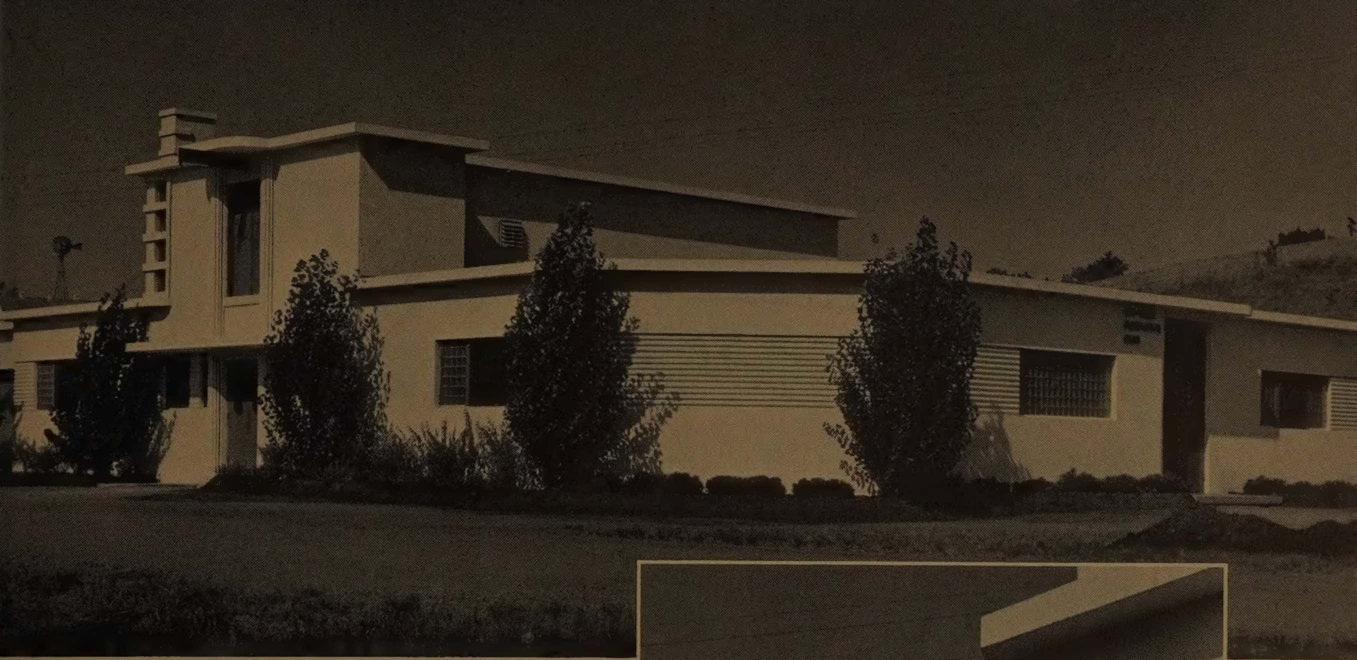
here every year, and absolutely free. One thing these tests have proved is that the fiction about concrete having a delicate nature requiring soft breezes and palm tree settings is pure nonsense. There are a hundred or more architectural concrete structures above the 46th parallel—and some of them were designed by our firm, and we have been watching them closely for several years.

Our use of concrete, however, was not dictated by any desire to prove points or settle arguments, but rather because we believe this material can withstand certain elemental hazards better than other materials. A case in point is the result of the 1919 cyclone in Fergus Falls which razed almost everything except a concrete frame structure. It was quite natural, therefore, that when there was a resurgence of public construction in 1935 we should want to use concrete not only as a framing material, but expose it as an architectural medium. Concrete fitted in well with our preference for contemporary styles and with the work program of the WPA which is long on labor but short on cash layout.

Our first project was the Clearwater County Courthouse, built in 1935-37 and illustrated here with photos made in late 1940. In a sense this was an experimental structure, both for us as designers and for the contractor who built it. There were some difficulties on that job and on others since, but no more than with any other materials we have used. After all, the business of architecture, engineering and construction is to overcome difficulties.

Then there was the Fergus Falls Water Purification Plant built in 1938. The use of reinforced concrete in the superstructure made it possible to secure a structure pleasing in appearance and economical in maintenance at a minimum of cost. This architectural concrete superstructure also fits in very well with the remainder of the plant as all necessary

The first architectural concrete project undertaken by Foss & Co., was the Clearwater County Courthouse at Bagley, Minn. Smooth forms of plywood were used on this building which was finished with white portland cement paint. A. Heddenberg & Co., Inc., Duluth, contractor.



Another attractive way of using horizontal fluting is found on the waterworks at Fergus Falls, Minn., another Foss design. John Lauritzen of Fergus Falls was contractor.

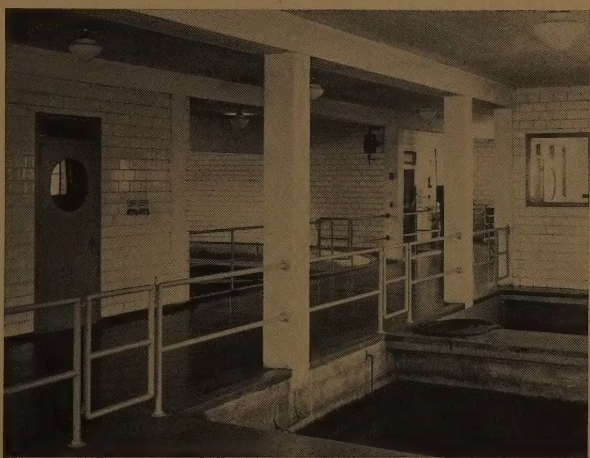
anks, filters, and reservoirs were built of concrete and have given highly satisfactory service.

In succeeding projects we have learned that when it is properly designed and properly placed, concrete will stand up anywhere. And we have learned also that experience in handling the material will result in progressively better designs and better workmanship. In this there is no difference between concrete and any other material.

Concrete offers unlimited possibilities in design. We have experimented with horizontal fluting as a simple, dignified method of accenting structural features on some buildings where we thought it appropriate. We have avoided complicated and bizarre forms for aesthetic as well as economic reasons. Concrete as an architectural medium is still in a state of development and consequently requires more careful study than do more familiar materials whose possibilities are fully known. For instance, when working with concrete the effect of the forms should be studied as much as the general appearance of the building because a concrete wall is an arrangement of molded surfaces.

Paint on a concrete building should be considered mainly as a decorative treatment. It should never be used so thickly that it covers or fills in texture. The molded surface is the character of concrete—not paint.

I have noticed that many architects after designing a few buildings in concrete are inclined to talk about it like a preacher. But it isn't exactly that. They are formulating their ideas and perfecting their technique in a new and interesting medium—and it helps to talk about it.



Interior of Fergus Falls waterworks.

City Halls and Community Buildings in ARCHITECTURAL CONCRETE

One of the outstanding features of the public works program during the past few years has been the construction of city halls and community buildings in towns where there were none before, or where city offices were housed in makeshift quarters such as the mayor's hardware store, under the constable's hat, or in the fire chief's backyard garage. Many of these new buildings include, in addition to local government offices, large halls where the citizens may gather for all kinds of public functions.

In many instances these structures have been built of architectural concrete and the architects responsible for them have demonstrated a keen appreciation of the problem of providing maximum facilities for the least money and with a minimum burden for maintenance expense. The designs show a fine understanding of the construction material and of its versatility.

City hall at Hanover, Kan., combines all city offices and fire department in one modern concrete building. Paulette & Wilson, Topeka architects, designed the structure and WPA built it.

William M. Ingemann, St. Paul, designed the modern concrete city at Tower, Minn. Built by WPA.

City hall and fire station at Junction, Texas—a modern concrete struc designed by Doyle C. Maddux, San Angelo, and built by force acco

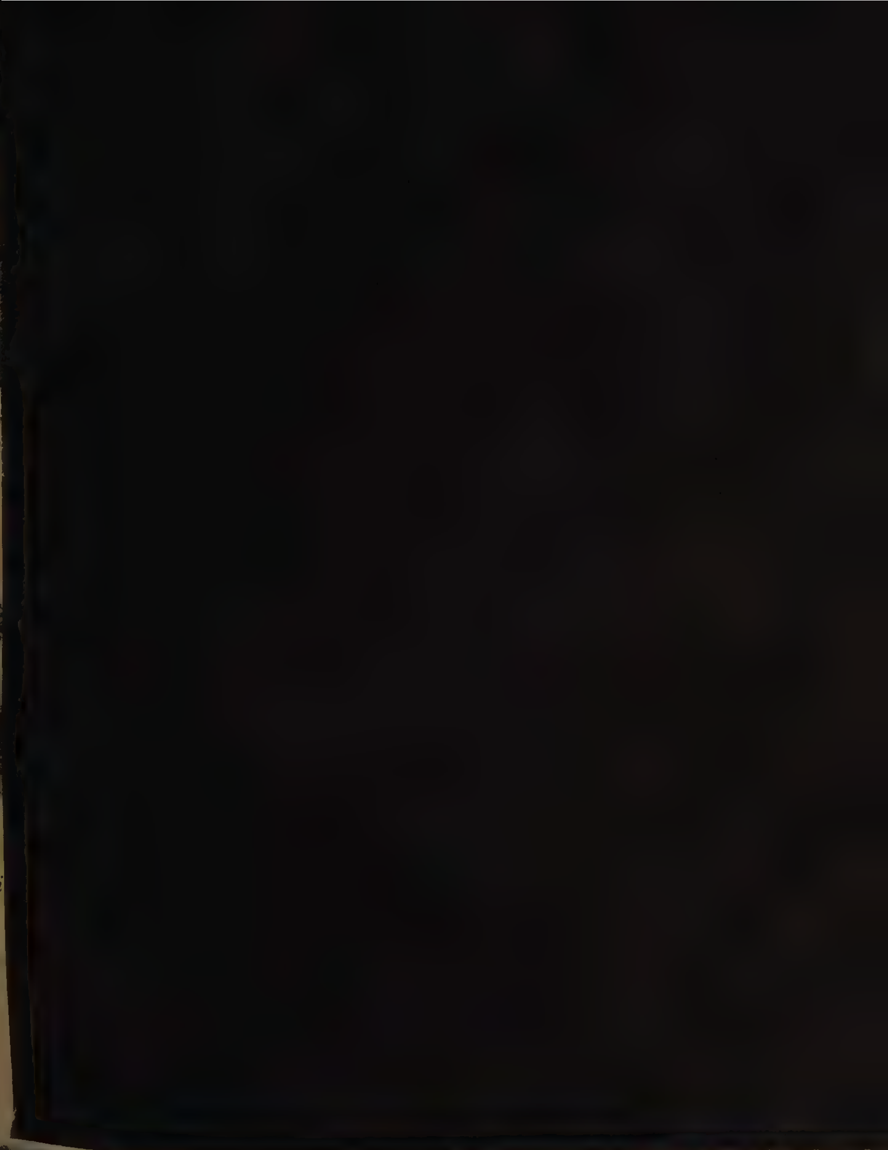
The city hall at Ontario, Calif., occupies a generous U-shaped space flanking an avenue of trees. It is architectural concrete in Spanish style, designed by DeWitt Mitcham of San Bernardino and built by WPA.

rth in Minnesota, at Baudette, the city hall and civic ce l concrete. Designed by Frederick W. Klawiter of St y WPA for $60,000.

T. Waller, architect of Hopkinsville, Ky., designed thi ll and fire station at Greenville, Ky. A WPA job.

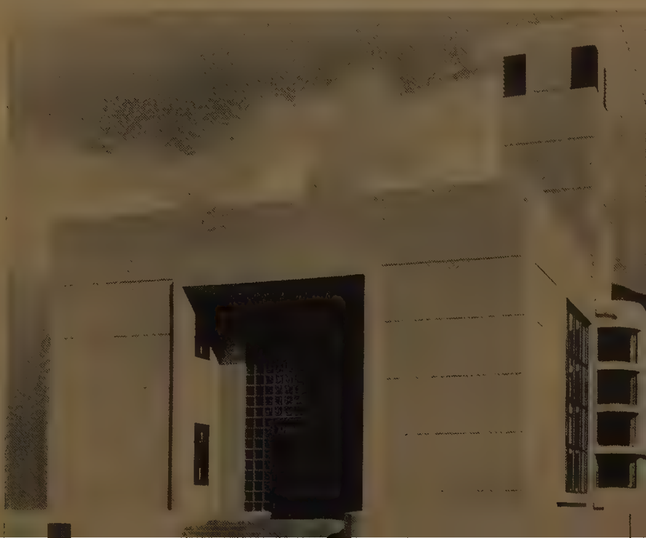
vald Thorson of Forest City, Iowa, designed this city hall at a, Iowa. WPA built it.

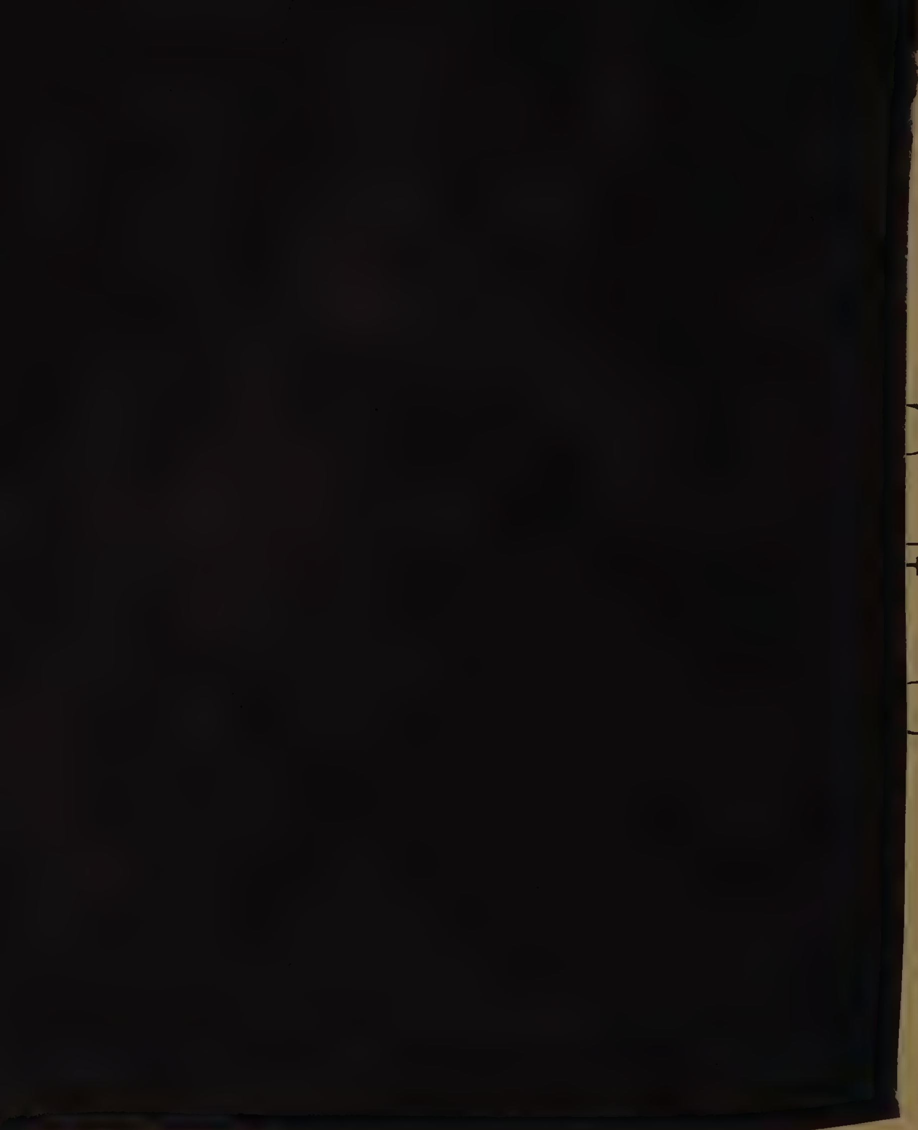
community building at Waverly, Minn., was designed by Walter Dennis, eapolis architect, and WPA erected it for $50,000.



Negro community center at Anderson, Ind., designed by Ernest Watkins. It was built by WPA for $30,000.

City hall and fire department, Revelstoke, B. C., Canada, was built in 1939. Designed by C. B. K. Van Norman, Vancouver architect, it was built by Moncreiff & Vistaunet, Vancouver contractors, for $38,000.





Disaster-Proof Fire Station—Gainesville, G

By Fred Roark*

On a rainy April morning in 1936, while textile workers were starting up their looms and early risers were drinking their first Coca Colas, a deathly stillness descended over Gainesville, Ga. Moments later a tornado struck and in five minutes the twisting wind had almost completely destroyed this little town at the foot of the Blue Ridge.

When survivors dug themselves out of the wreckage and established contact with the outside world, relief headquarters were set up in the Hall County Jail, one of the first modern concrete structures in Georgia, and almost the only building in the path of the tornado to withstand

Hall County Jail, in Gainesville, one of first concrete buildings in Georgia, withstood the great tornado of 1936.

*City manager, Gainesville, Ga.

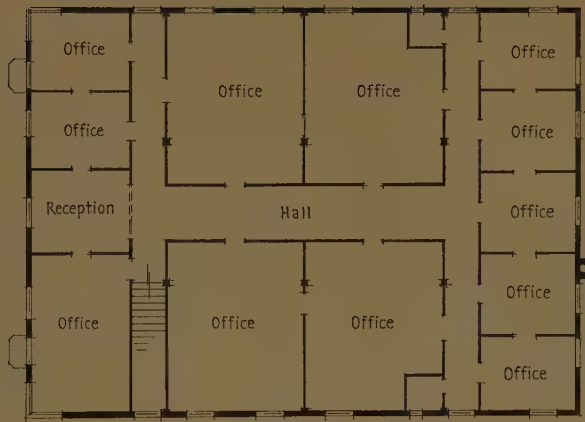
the force of the wind (*photo bottom page 14*).

Three years later, with the city almost completely rebuilt, plans were drawn for a fire station that would combine several needed facilities—storage space for fire equipment, living quarters for firemen, office space for the overflow from the city hall, and for federal agencies such as WPA which work in cooperation with municipal authorities.

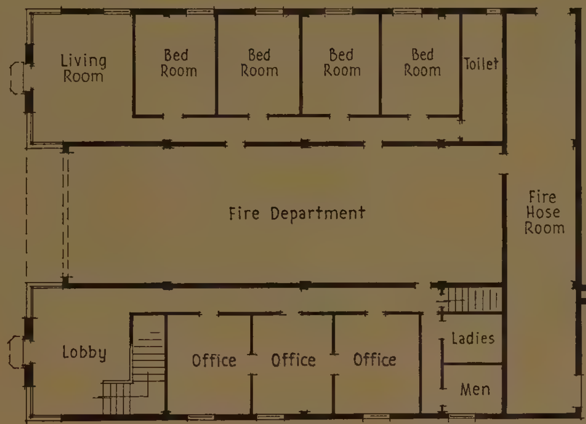
The structure was designed in architectural concrete for several reasons. Probably first in our minds was the thought of another tornado, and the recollection of how the Hall County Jail went through one such disaster practically unharmed. As the building was to face Courthouse Square, it was necessary for it to conform to the rather monumental characteristics of the courthouse and city hall. With architectural concrete we could obtain this conformity at low cost. As designed, the building is a simple, rather modern two-story structure. Construction of this type of building was readily adaptable to the type of labor available to WPA.

Walls are 10 in. thick up to window sill height on the first floor and 8 in. above this point. Forms were of T&G lumber. Walls were rubbed as soon as the forms were stripped, and painted with white portland cement paint.

Floors throughout are of concrete finished with asphalt tile in offices and living quarters. The structure has a flat slab concrete roof.



SECOND FLOOR



FIRST FLOOR 0 5 10 15 20 25

Fire fighting equipment is housed in center of the building with city offices occupying part of first floor and all of second floor.

Two units of Slossfield Community Center, a social service center for negroes in Birmingham, Ala. E. B. Van Keuren, of Birmingham, was architect.

Youth Center—in Alabama

By E. B. Van Keuren*, A.I.A.

WHEN the National Youth Movement was launched several years ago, a group of influential Birmingham citizens recognized in the new interest and attention focused on child welfare, an opportunity to develop a long needed program for aiding underprivileged youth in certain districts of the city. With fairly definite ideas of the type of welfare program that was needed, and adequately advised by medical and educational authorities in the city, these citizens called on the city commission and laid before it a program calling for the creation of youth training centers—and asked for the cooperation of the commission. The commission responded by setting aside desirable locations for the construction of buildings and recreational areas.

With this encouragement and accumulation of tangible property, the citizens pushed their plans toward a definite proposal which was presented to the Federal Emergency Relief Administration. The result was the earmarking of sufficient funds which, added to the gift of land by the city, enabled perfection of plans to build youth centers.

The first of these, a health, educational and recreational center for negro youth, is located in north Birmingham. It is called Slossfield Community Center.

This institution has been put to use as rapidly as each unit was ready for occupancy. Except for a few refinements which will be left to the future, the buildings and their

*Birm.ngham, Ala.

functions substantially realize the plans originated by the citizens' committee.

The left unit of the group is a health building, or clinic, which provides both preventive and curative services. It is equipped for all forms of medical practice including X-ray and operating facilities. One wing of the building is devoted to social and case history consultation. To the rear and right of this building is the recreational building, large enough for a standard basketball court. Its uses, however, are varied since it is provided with a stage, dressing rooms and temporary seating for 500 when it is needed as an auditorium. Included in this structure are two large social rooms, one of which is provided with a kitchen.

The building to the front and right of the health building is the completely equipped maternity building. This unit is so planned that it may some day be used for general administration of all welfare work in the neighborhood. Farther to the right in this group is another building, the educational unit, which contains two large vocational rooms for boys and girls, four classrooms and a library.

All the buildings were designed to present a clean, bright, modern appearance, and to achieve this architectural concrete was selected as the building material. Appearance, however, was not the only reason for using this material: for a plant of this kind, subjected to almost continuous day and night use, must be of strong enough construction to defy damage and wear. It was realized also that maintenance must be kept to a minimum if the Center were to be kept in operation without deficits. The simple structure made possible with concrete was considered a major advantage in eliminating costly maintenance, and the firesafety of the material was another distinct advantage.

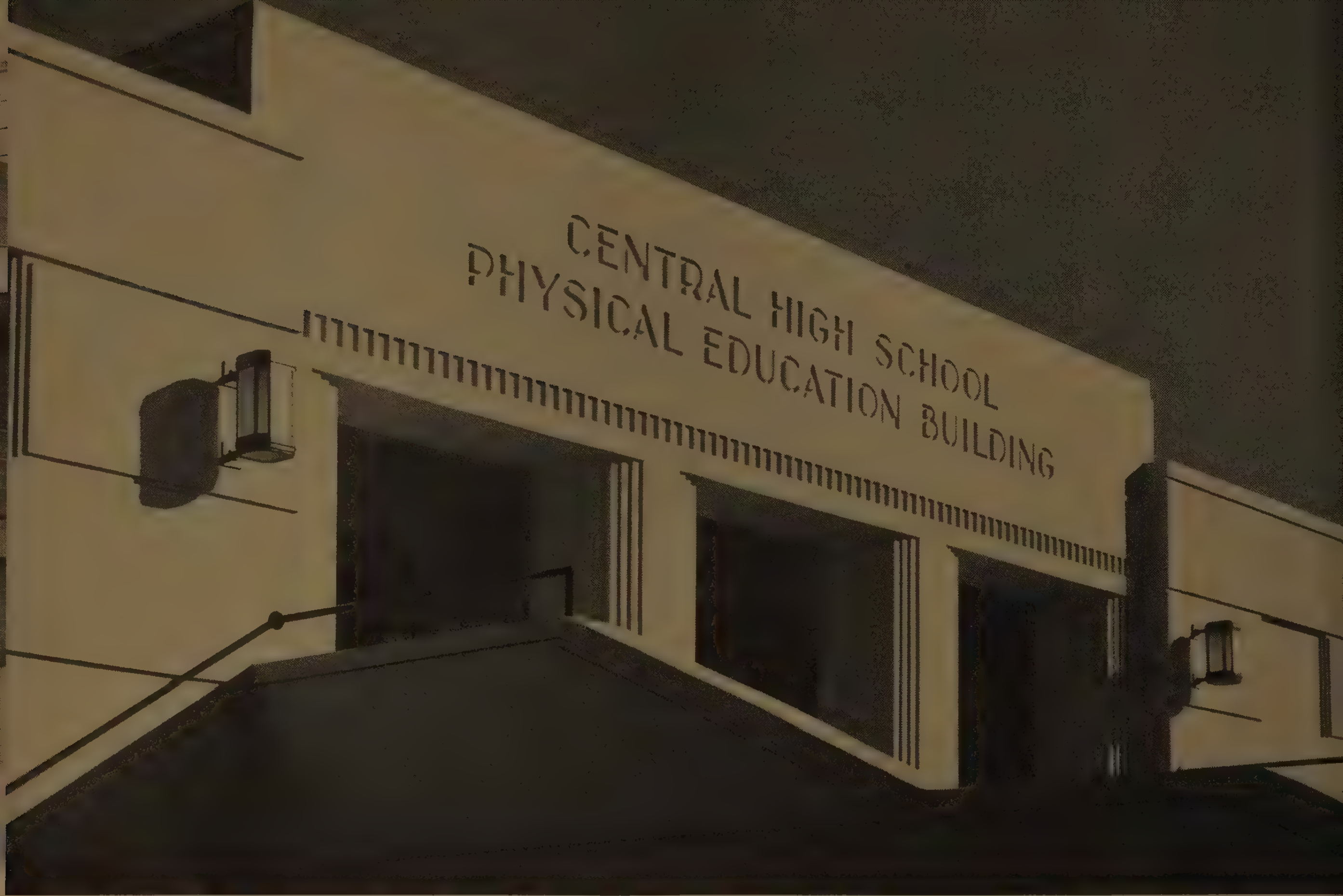
All construction was done by WPA labor, unfamiliar with this type of work at the outset. With careful supervision the crews were rapidly trained to produce good work, and the forming—as photographs reveal—indicates unusually good craftsmanship. Wide form boards were used and the resulting texture is pleasing. The simple details were molded with milled wood forms. Thus far there has been no finish treatment of any kind aside from pointing up the small holes left by tie rods.

Cost of the project when fully completed, will represent a total investment of about $500,000 including land, buildings and equipment. Since these buildings are located on spacious grounds and provide welfare facilities for a large, densely populated area, this sum can be considered very small for such benefits.

The sponsors and planners of this project received full reward for their efforts when last year in a nation-wide field with 87 entries, Slossfield Community Center was judged winner of the first prize for the best planned and operated negro community center.

Interesting texture formed by chamfering the edges of form boards to accentuate joint lines.

The recreational unit provides large courts for games, and kitchen and dining space for public functions.



Main entrance to the new fieldhouse at Xenia, Ohio, built to provide the local high school and the community with adequate athletic facilities. Marlay W. Lethly and Herman T. Hunter, were associated architects; Paul G. Cannon was structural engineer; and Kloepfer & Duff were general contractors—all of Springfield, Ohio.

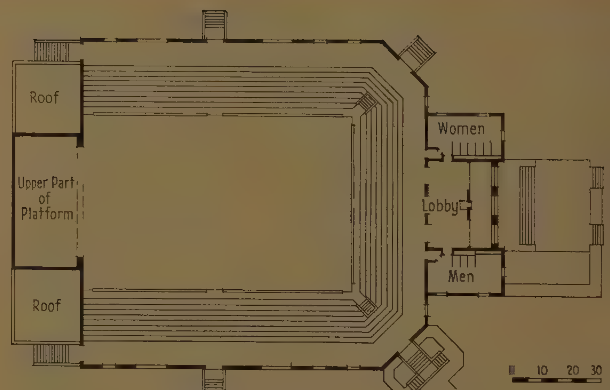
Fieldhouse in Ohio

By Marlay W. Lethly, Architect*

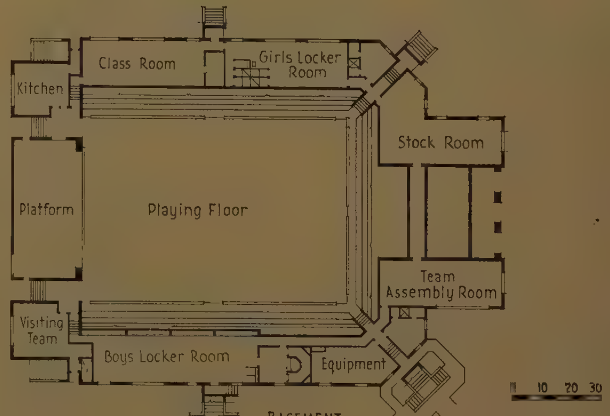
TODAY the pride of Xenia, Ohio, is its recreational center and fieldhouse, erected by the board of education and declared to be the most complete and spacious community center in the Midwest—at least in a city of the size of Xenia.

Modern in architecture, the structure is entirely of architectural concrete except for the columns, trusses and purlins supporting the roof slabs. It was completed and occupied September 1, 1939 at a cost of $125,000 provided for by two bond issues and by a grant from PWA.

*Springfield, Ohio.



FIRST FLOOR



BASEMENT

For years Xenia High School had regarded with envy other more fortunate schools in this part of Ohio which could play host to district basketball tournaments, whereas its own gymnasium was too small even to accommodate the school's own intramural activities. In 1938, the board of education sponsored a bond issue and announced plans for construction of an architectural concrete fieldhouse. This building would not only be equipped to handle local and district athletic events, but would provide a 2,700 seating capacity auditorium for public gatherings, kitchen, dining room for 500, and a huge stage making the building ideal for concerts and theatrical performances because careful attention was given to the acoustics.

One of the many entrances to the fieldhouse.

Realizing the wide variety of community functions such a building would shelter, all civic bodies of the town endorsed the bond issues and worked hard for their adoption.

Designed for a plot of ground near the high school and adjacent to the school athletic field so it might serve as a fieldhouse during football seasons, work had hardly gotten under way when it was discovered that the site had been formerly a gravel pit filled with ashes and the usual debris of a city dump. This required sinking piers and footings to solid ground, in some cases to depths of 12 to 16 ft. below finish grade.

Architectural concrete was selected as the material of construction because of its economy, firesafety and pleasing modern appearance. All exposed walls were formed against plywood and were cleaned down thoroughly after forms were stripped. This was followed by two coats of white portland cement paint.

The building is 112x169 ft. with a playing floor of 60x90 ft. Bleacher capacity is 2,000. Under the bleachers on one side is the team assembly room, equipment room, drying room, locker and visiting team quarters. On the other side is a stock room, girls' locker room, classroom and kitchen. The unit cost of construction including all mechanical trades was slightly more than 25 cents per cu.ft.

The roof slab is of precast concrete with 1-in. acoustical and insulation treatment on the underside. Sound is thus controlled so well that voices on the 23x45-ft. stage can be heard equally well in all portions of the building.

Construction of the building required ten months, during which time the citizens of the town held a sustained interest in the work—both in anticipation of the long-wanted fieldhouse and because this method of construction is relatively novel in this region.

General view of the building, an architectural concrete structure with seating capacity for 2,700 at public gatherings.

One of two main entrances to boys' gymnasium, Herbert Hoover High School, San Diego, Calif. Kistner & Curtis, architects, and William T. Wright, structural engineer, of Los Angeles. Chas. Hoskins of San Diego was contractor.

Hollow Cantilever Frames Carry Roof

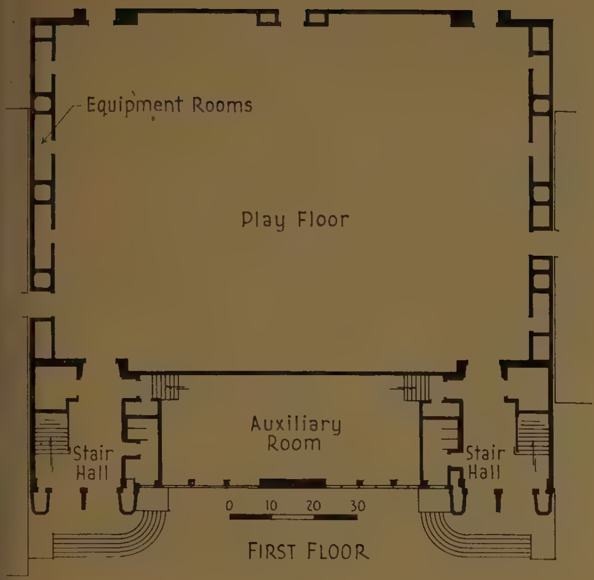
By William T. Wright, Structural Engineer*

IN THE design of the boys' gymnasium at Herbert Hoover High School in San Diego, Calif., the chief problems confronting the architects were those of fitting this building between existing shower and locker units, and of eliminating any direct sun glare from the gymnasium floor. The footings of the existing buildings prohibited a wide spread of any new building footings along these walls. The large ground floor area and occupancy of the building required that it be of firesafe construction.

The layout selected for the building was that shown in the accompanying plan. There are no windows in the walls of the play floor area, all daylight coming into the room from the skylight roof. This arrangement gives an average of 40 foot candles of light at 5 ft. above the floor, without sun glare in the eyes of players using the gymnasium. Sufficient exits to the exterior are provided as well as an entrance into each of the existing shower and locker units. Space between columns is used for storage, and below the mezzanine floor an exercise room and toilets are provided.

Seating consists of collapsible bleachers placed in the wall recesses on either side of the play floor, and the same type of bleachers are to be installed at mezzanine level when

*Office of Kistner & Curtis, architects, Los Angeles.



this area is used for spectators rather than as an auxiliary exercise room.

Since there are no windows, mechanical ventilation is obtained by means of a continuous ridge ventilator designed to give an air change of 30 cu.ft. per minute for 800 persons at a minimum wind velocity of 4 m.p.h. Air intake louvers are installed in the walls to allow for incoming fresh air. Both the ventilator opening and the air intake louvers are adjustable for control of the ventilation system, the ridge ventilator being electrically operated.

Architectural concrete was chosen for both the exterior and interior of the building, using plywood forms for all exposed surfaces. Control joints are incorporated in the design of the front of the building and are also placed in the panels between the large columns at the ends of the building. Acoustic treatment, 1 in. thick, is placed in panels and bands around the play floor and mezzanine.

The structural design of this building embodies several unusual features. Cantilever footings were used to keep from undercutting the existing building foundations, and roof girders were constructed as cantilevers off the heavy wall columns in order to keep all heavy dead loads adjacent to the supports of the roof. The center portion of the roof is a steel skylight. This type of framing lent itself to economy of design for several reasons: heavy dead loads were eliminated at the center of the roof span; the moment due to cantilever action of the roof beams could be carried down through the columns to counteract the cantilever footing moment at the base of the column, thus giving a fixed end condition at top and bottom of the columns; and the height of the building could be reduced approximately 8 ft. to give a better architectural design.

Roof cantilevers are spaced 21 ft. on centers and extend out 27 ft. from the back of the columns, thus making the clear span of the steel skylight trusses 69 ft. 8 in. Part of the cantilever moment in the columns is offset by the

General view of the main facade. The building is flanked by two existing structures, necessitating cantilever footings to avoid undercutting old building foundations. There are no windows except at stairwells. Light for playing floor comes from skylights.

weight of the exterior panel wall between columns, which is hung from the column face. Roof slabs between the cantilevers and over the mezzanine level act as horizontal diaphragms to carry the lateral forces due to wind or earthquake into the wall units. This type of roof made it possible to provide for a future opening in the west wall, at no extra cost, similar to that at the east wall of the play floor, so that a mezzanine floor could be constructed on the west side also. This opening was filled in with a temporary wall of metal studs and plaster.

A concrete floor slab, 2 ft. 6 in. above the ground, serves as a horizontal diaphragm at the first floor level.

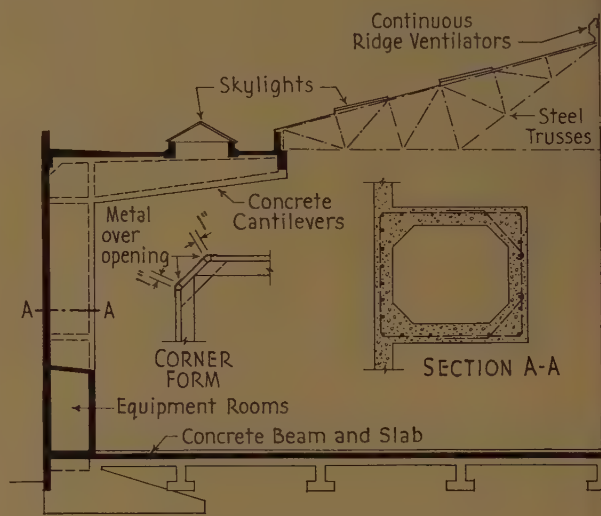
The large columns and the cantilever beams were designed as hollow members in order to increase their stiffness and also to give economy with a pleasing architectural effect. Interior forms were constructed of wood and left in place after the concrete was placed.

The accompanying detail of one of the columns indicates the corner form construction used. This detail is typical for this type of construction.

A check of the deflection at the ends of the different cantilevers showed a variation of from $\frac{1}{8}$ to $\frac{5}{8}$ in. after shoring was removed and the roof completed.

The concrete roof slab on three sides of the skylight provides excellent bracing to take care of the lateral forces. At the same time, the slab over the cantilevers tends to stiffen this section of the roof to such an extent that it relieves a part of the cantilever action. As the cantilevers deflect, the tendency for horizontal displacement of the top of the columns is taken up by the roof slab as a horizontal diaphragm and the load is transmitted to the end shear walls.

Comparison of the contract cost of this structure with that of similar structures designed by this office revealed that this building was erected for considerably less than in cases where full span steel trusses were used.



Section through foundation and wall.

The roof structure is carried on hollow cantilever frames. The cantilevers are spaced 21 ft. on centers and extend out 27 ft. from the walls. Between cantilever beams are skylights which illuminate the edges of the play court.

This concrete auditorium, built by the Cass County Agricultural Society at Weeping Water, Neb., serves as an exhibit building at the county fair, as office for the Society, and as a civic center. Designed by N. Bruce Hazen, of Lincoln, Neb., it was built at a cost of $42,000.

Auditorium for Weeping Water, Neb.

By N. Bruce Hazen, Architect*

ON AUGUST 3, 1940, the Cass County Agricultural Society dedicated its new auditorium located on the fair grounds in the town of Weeping Water, Neb. The building fills three needs—providing additional space for use during the annual county fair which is a tradition in Cass County, permanent quarters for the Agricultural Society, and a much needed civic center for the village of Weeping Water, a thriving community of 1,200.

It is located at the foot of Main St. at the entrance to the fair, and convenient to the town.

The main floor comprises auditorium with stage and dressing rooms, and an exhibit room. Nearly every room in the building has a dual purpose. The arrangement of the building provides two entrances at street level, each equipped with an extra wide stair leading to the full basement. The sloping site permits grade exits from basement level to other buildings on the fair grounds. In the basement is a kitchen and banquet room.

Structurally the building is quite simple. The basement and exterior walls are architectural concrete, the main floor, concrete beam and joist construction; the roof, sheet plywood on steel trusses and channel purlins. All interior walls are plastered; the ceilings, covered with composition board.

Ornamentation of the exterior was made as simple and at the same time as effective as possible, for two reasons: to hold costs to reasonable limits, and to insure good construction by WPA which allows few skilled mechanics. The decorative detail is confined to fluting and horizontal rustications, and the name of the building in incised letters cast in place.

The project was completed at a total cost of $42,000 including all labor and materials. S. C. Lein was in charge of construction and was responsible for a very fine job.

*Lincoln, Neb.

Seattle Armory

By A. M. Young*, A.I.A.

THE Washington National Guard has recently occupied a new field artillery armory in Seattle. It is a four-story building, fully equipped to house the 146th Field Artillery, the 205th Antiaircraft Regiment, and headquarters of the 66th Brigade of the Washington National Guard. The building covers an entire city block, 256x360 ft., and has a covered floor area of 7 acres. The site is unusual in that there is a difference in elevation of 35 ft. between diagonal corners of the building. The architects have utilized this difference to provide grade level entrances to different floors.

A huge drill floor, approximately 250 ft. square, is flanked by galleries which provide locker rooms for the various batteries of the regiments. The framing of this floor is an unusual flat slab having interior panels 32x37½ ft., and wall panels 32x40 ft. The slab is designed for a load of 150 p.s.f.

Beneath the drill floor is a large garage for the motorized equipment, and beneath this is a target range.

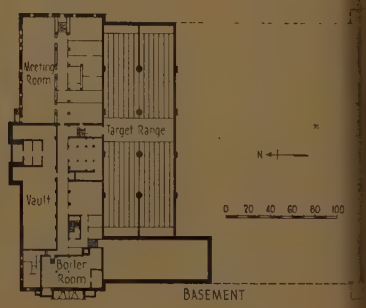
Architectural concrete was chosen for the building's exterior because of its reasonable cost and adaptability to use in bold masses. To achieve the desired effects as well as necessary structural strength, the exterior walls vary in thickness from 16 to 30 in. Emphasis of the horizontal character of the structure is increased by the use of broad bands of dark, hard-burned brick set on edge.

All concrete surfaces were formed with plywood. In the basement and first story these were marked into horizontal

*Seattle, Wash.

Seattle's huge new architectural concrete field artillery armory was designed by A. M. Young and F. A. Naramore, Seattle architects. A. D. Belanger Co., of Everett, was general contractor; Sound Construction & Engineering Co., Seattle, was contractor for interior finish.

Below—A portion of the 250-ft. square drill floor.



Erected on a site that slopes from diagonal corners of the building
concrete walls were formed against plywood squares, the joints

courses by triangular strips nailed to the plywood. In t
upper stories the plywood was cut into 24-in. square pane
which were placed closely side by side, the faint margin
joint lines and the variation in texture of the plywood uni
serving to create a pattern and to relieve the monotone
large surfaces. Form ties through the walls were located
the corners of these 24-in. panels and no other cutting
drilling of the form sheathing was permitted.

Control joints were used in the walls, spaced at ever
second panel or on 64-ft. centers. They have functioned a
planned. A considerable period intervened between th
placing of the main floor of the building and the walls above
and experience seems to indicate the desirability of a some
what closer joint spacing in such instances. To eliminate
horizontal joint lines, floors were placed first and spandrel

4-H Building at Minnesota Fair

By G. P. Lagergren, Architect*

WHEN boys and girls of 4-H Clubs came to the Mi nesota State Fair last August they had one of th most unusual and exciting experiences of their lives—tha of living for a week on the Fair grounds in one of the large exhibition buildings to be found at any state fair. The literally lived in the building for it not only provided exh bition space for their exhibits, but a huge dining room fo 2,400, and two large dormitories with double-deck beds fo 1,200 girls and an equal number of boys.

Aside from this immense space used by 4-H members, a arcade almost completely surrounding the building pro vides scores of concession booths offering everything from smorgasbord to homemade fudge.

The building is a modern concrete structure, three storie high with a tower dominating the main facade. The mai floor, reserved for demonstrations and exhibits, covers a

*St. Paul, Minn.

A tall tower dominates the main facade of the 4-H Club Building at Minnesota State Fair Grounds near St. Paul. Over the main entrance is the 4-H emblem, molded in concrete (see right). Illuminating the tower are glass panels. Colored lights behind these glass panels give the tower an impressive appearance at night. G. P. Lagergren of St. Paul was the architect.

General view of the building, one of the largest ever erected by WPA labor. It serves as lodging hall for 2,400 girls and boys during Fair Week. Ground floor houses exhibits and concessions.

ong hall is the cafeteria where the 2,400 4-H Club members eat the Fair.

area of about 52,000 sq.ft., its extreme dimensions being 352x155 ft. The floor above, reached by stairs in the tower, s a long dining room and auditorium, complete with kitchen at one end and a large stage at the other. The third floor, divided into two large halls each of which opens onto the ower, provides dormitory space for 2,400 youngsters, with howers, lavatories and toilets located in the tower.

The tower rises 90 ft. above the ground and is distinguished by the 4-H emblem molded in concrete above the entrance. In each face of the tower are two glass block llumination panels, running the length of the second and third floors on three sides.

On a structure of such size one of the main problems confronting the architect was that of breaking up the monotony of broad wall areas without too costly ornamentation. This was done easily in architectural concrete by arranging large and small surfaces into panels molded with the wall. The cost of such decorative detail is little more than that of forming plain wall areas.

The advantages of concrete for a building of this type are apparent. The building is used principally during the one big week of the Fair each year, and its use at that time is constant. With concrete floors and exposed concrete walls, it is easy to keep clean and sanitary. During the long period the building stands vacant it requires no maintenance, is ready for use the following year. And as an exhibition building it will retain its pleasing appearance through many seasons.

The 4-H Building is the newest of many concrete structures erected at the Fair grounds during the past five years. A horse barn, poultry exhibition building and concession sheds—all of concrete—form a gleaming white community at the very center of the Fair. These buildings symbolize the modern, progressive spirit of one of the nation's largest and best attended state fairs.

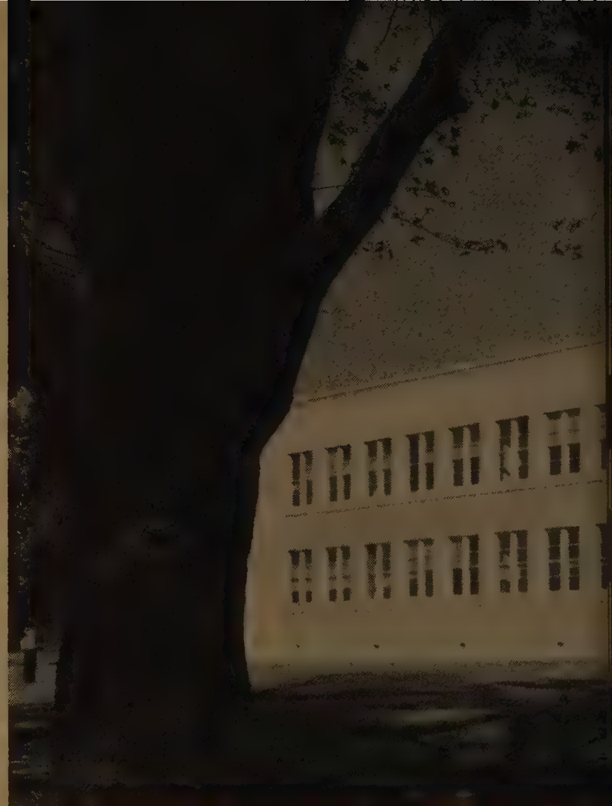
Construction work on the 4-H Building, like that of the other new concrete structures, was done by WPA, and is one of the largest building projects ever undertaken by that organization.

Sheffield High School—Alabama

By Howard A. Griffith*, A.I.A.

WHEN the old Sheffield High School was completely gutted by fire in April, 1938, it seemed to the citizens of this town a tragedy of the worst order. It had destroyed the largest unit of an already outgrown school system. But three years later that fire is regarded as more of a blessing than a disaster, for it provided the impetus for a school program under which not only the old school structure was rebuilt to stand better than it ever was before, but all other schools in the town have been reconditioned and modernized, and best of all—a large new building has been added to the system. This program has been accomplished at a cost of some $250,000 raised by bond issue and augmented by PWA funds.

*Sheffield, Ala.



A fire which gutted old Sheffield (Ala.) High School in April, 193[illegible] entire school system. The new school, as modern as tomorrow, was d[illegible]

Smooth walls and modern use of glass characterize this new building. The walls were formed against plywood.

Following the fire the superintendent of schools, C. M. Brewster, and the writer made the first really comprehensive survey of the Sheffield school system. Space requirements were studied on the basis of past records, probable future growth and modern educational requirements. Maximum safety and minimum of maintenance and upkeep were considered of primary importance in any school building program to be undertaken.

From this survey the building program was developed, plans were prepared and estimates made so that a bond issue could be proposed and applications made for Public Works Administration assistance. The program consisted of rebuilding the burned structure for use as a junior high school, renovation of the old junior high for a grammar school, alterations to an elementary school built in 1892, and construction of a new high school building on a new site.

Three city blocks were acquired for the high school plant. This building was to incorporate the most modern ideas in planning, design, equipment and construction. The build-

r a school building program which included construction of a new, large high school in architectural concrete and renovation of the town's
Griffith, architect of Sheffield. The building was erected at a contract price of $130,000 by A. J. Honeycutt, of Birmingham.*

g was to include an auditorium to be used for community airs, and various other types of classrooms required for ult education, as well as the usual modern school program.

With the recent fire in mind, it was determined that the w building would be as firesafe as possible. Accordingly, er due study of many buildings of various types of construction it was decided to build of concrete because with this construction we felt we could realize the utmost in firesafe construction and low maintenance cost with the funds available. Exterior walls, beams, columns, corridor floors and stair halls are all of reinforced concrete.

e end of the building is a large auditorium which is frequently d for civic functions.

The building is modern in design, formed against smooth plywood form liners. Ornament is used sparingly both as a measure of economy and because the arrangement of masses produces pleasing appearance without molded details.

Contract was let for about $130,000 and work commenced on April 1, 1939. The school was ready for occupancy for the second term in 1940.

The school has accommodations for 400 students. The auditorium seats about 800. Lack of funds prohibited construction of a gymnasium as part of the school building project, but a gymnasium and a fieldhouse are planned for the future, and in view of the splendid results obtained in the school, these structures will also be architectural concrete.

Today Sheffield is years ahead of its public school requirements whereas three years ago it was decades behind. Now when citizens come to the new school to participate in the many public functions that take place every week, they are convinced that the fire which seemed so bad was really a lesson in civic planning.

Among the most modern courthouses in the Southwest is the one at Odessa, Ector County, Texas. Continuous bands of windows alternate with concrete spandrels to give a strong horizontal feeling to the four-story structure. Elmer G. Withers Architectural Co., Inc., of Ft. Worth, designed the building. James T. Taylor, also of Ft. Worth, was the contractor.

Ector County's Modern Courthouse

By J. O. Taylor*

As LONG as cattle raising was the chief industry of Ector County, Texas, an old courthouse that had served faithfully for many years was adequate for carrying on the legal business of the entire area. Then oil was discovered in the county, and development of this new industry brought such an influx of new business and population that the old court facilities became obsolete practically overnight.

Wishing to keep abreast of the new spirit of development, the people of Ector County voted favorably on the issuance of $150,000 in bonds to finance construction of a modern building. This bond money was supplemented by $100,000 in short time warrants because oil development had so increased county revenue that this method of financing was cheaper than serial bonds covering the total expenditure.

Those concerned with the planning of the new courthouse wanted a modern structure. As it stands, the building is about as wide a departure from traditional courthouse architecture as can be found anywhere in the country. It is a three-story building with a penthouse, distinguished by continuous bands of windows which are interrupted only by two massive pylons located at the center of each facade. These bands of windows are divided by plain concrete spandrels, and the only other detail consist of molded plaques at the tops of main entrance pylons, precast grilles over the entrances, and the horizontal fluting on the penthouse coping which forms a background for the metal sign.

The devices at the top of the pylons symbolize the devel-

*Manager, James T. Taylor, contractor.

opment of the community: the left panel representing an Indian spearing a buffalo, and the right, a cowboy about to rope a steer.

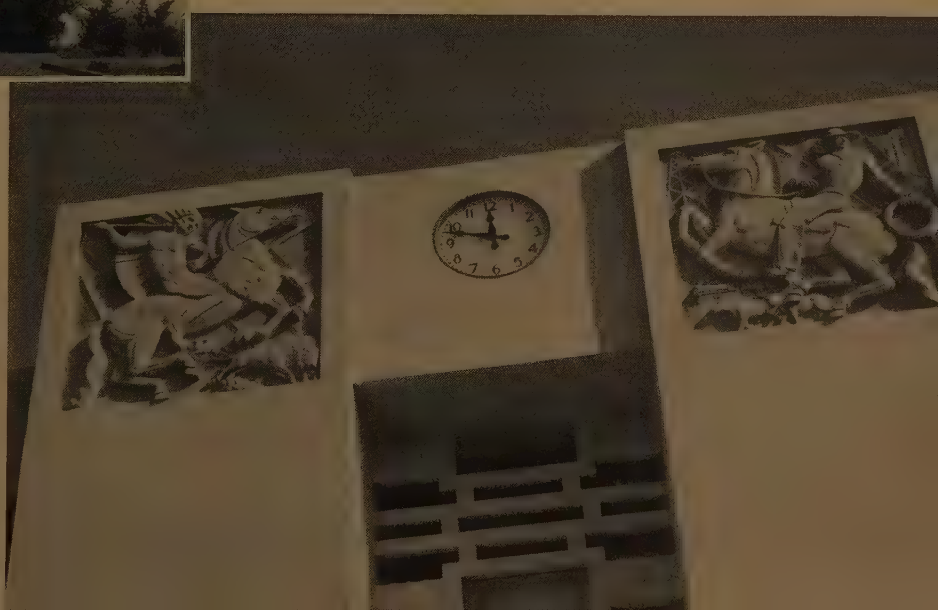
Although financing the courthouse was not difficult, it was decided that the cost should not exceed $225,000, including a sum of $25,000 for purchase of equipment and furnishings. Accordingly, alternate bids were taken for several types of construction to determine the least expensive without sacrificing quality. Tabulation of the bids revealed that architectural concrete would cost $180,312 including mechanical trades but exclusive of prison equipment. This was $17,861 less than limestone backed with common brick and $12,061 lower than face brick with common brick backup. Since concrete was so well adapted to the design, there was no hesitation on the part of the commissioners' court to accept concrete and proceed with the work as rapidly as possible.

Work started in August, 1937 and was completed in April, 1938. A sizable building (its general plan is 77x124 ft. with full basement and 43x84-ft. penthouse) it contains 479,160 cu.ft., making the unit cost 38 cents exclusive of furniture and prison equipment.

Ector County Courthouse is entirely reinforced concrete, including footings, frame, floors, roof and walls. All forms were carefully designed before erection began. The wall forms were made of 1x6 surfaced boards, lined with ¼-in. plywood. Plaster waste molds set in the forms were used to form the plaques on the pylons. A pull-out type of form tie was used which left a very inconspicuous hole to plug.

Concrete designed for uniform quality with 6¾ gal. of water per sack of cement was used throughout the job. The slump was varied according to use by adjusting the proportions of fine and coarse aggregate to the cement. Not less than 5½ sacks of portland cement was permitted to a cubic yard of concrete.

Buggies were employed to distribute the concrete from a receiving hopper to the forms where it was placed in lifts varying in height from 4 to 12 ft. Use of external mechanical vibration in addition to hand spading resulted in smooth wall surfaces. When forms were stripped there were very few blemishes that required attention and only a light rubbing with carborundum stones was necessary to produce the even texture desired by the architect. The exterior is finished with two coats of paint of an oyster-white color.



Decorative detail is limited to precast grilles in the three entrances and to molded bands about the top-story jail. Topping the pylons flanking the main entrance are two large molded plaques symbolic of the history of the region which, before oil became the main business, was a favorite hunting ground of the Indians and later, cattle country.

Asheville Builds an Auditorium

BY LINDSEY M. GUDGER, ARCHITECT*

WHEN the new auditorium-convention hall at Asheville, N. C., was in initial plan stages, city officials expressed the desire that the building be designed for many uses: for operatic performances, basketball games, drills, other athletic events, and especially for conventions and exhibitions where a large flat floor area is necessary. The building was, therefore, designed with a flat floor with a removable sloping floor which can be speedily erected on occasions when banked seating is required for visual comfort. The building, as it stands, is a truly community enterprise for it serves the entire public for a multitude of purposes.

Due to limited funds it was necessary to take every possible advantage in saving construction costs. This economy, however, was not to be achieved at the sacrifice of an impressive facade. It was, therefore, the first obligation of the architect to design a building of pleasing appearance and then find a way to build within the allowable funds.

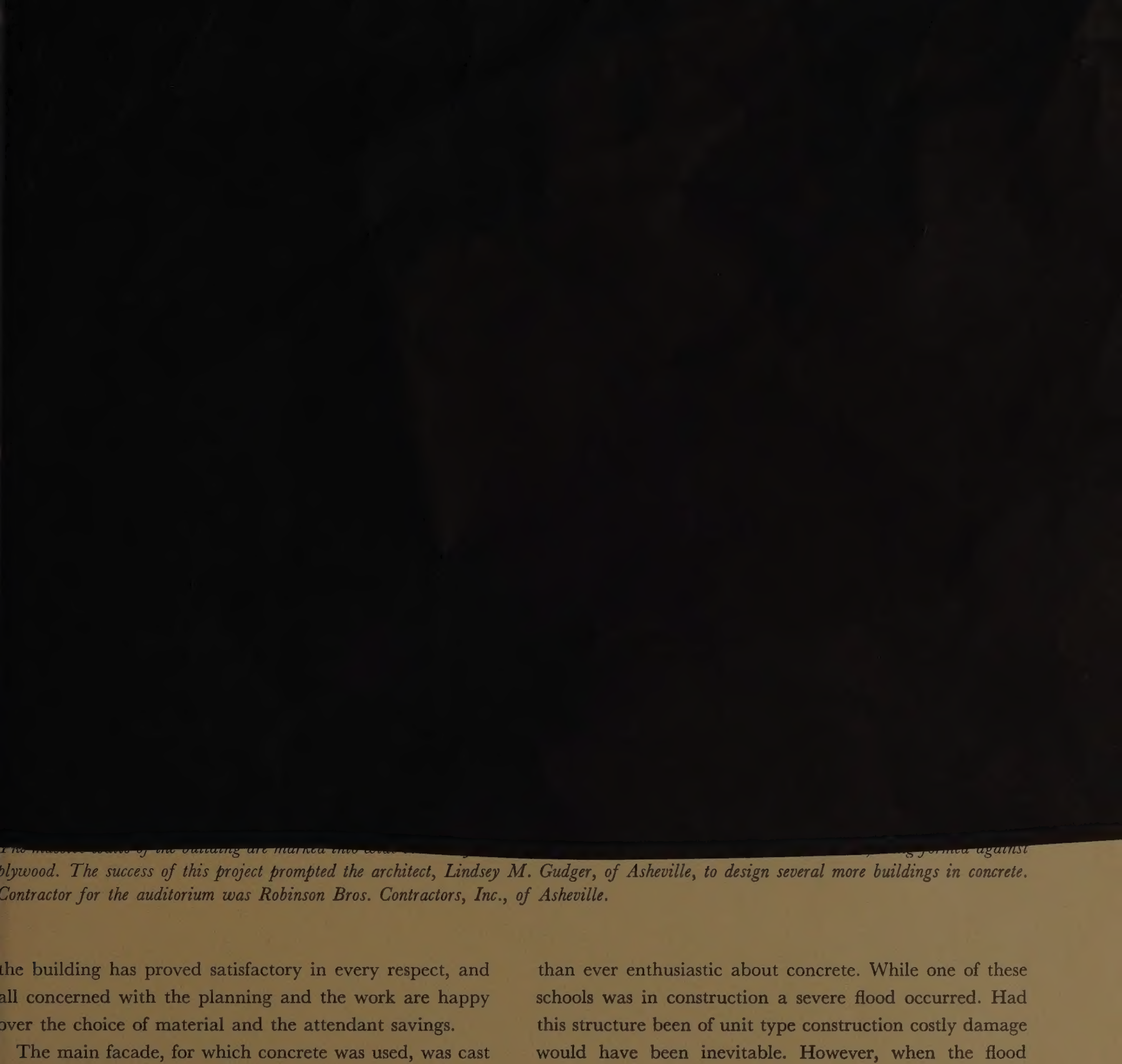
A study of the site and the surrounding neighborhood seemed to call for a structure of a light-colored, modern exterior. The building was designed for a limestone facing on the main facade, but during the preparation of final plans I became interested in the possibilities of architectural concrete as a solution to the problems of achieving impressive appearance and conserving building funds. Further investigation into the use of concrete was convincing evidence that alternate bids should be taken on limestone and architectural concrete and that the resulting bids should be allowed to govern the choice of the building material.

Upon opening the bids it was found that, in a total expenditure of approximately $240,000, a saving of about $7,000 could be made by using architectural concrete. Concrete was then recommended to city officials with the suggestion that the savings could be applied to additional equipment for the building and furnishings that might otherwise have to be dispensed with for several years. Permission was granted for this change in construction plans and the structure was built with an architectural concrete facade.

So successful were the results obtained in concrete that

*Asheville, N. C.

The new public auditorium in Asheville, N. C., has a facade of architectural concrete, this material being selected after alternate bids revealed an appreciable saving over other materials.



plywood. The success of this project prompted the architect, Lindsey M. Gudger, of Asheville, to design several more buildings in concrete. Contractor for the auditorium was Robinson Bros. Contractors, Inc., of Asheville.

the building has proved satisfactory in every respect, and all concerned with the planning and the work are happy over the choice of material and the attendant savings.

The main facade, for which concrete was used, was cast against smooth plywood with construction joints located in wide rustications. The large concrete areas are thus broken up into wide coursed bands that give a splendid appearance of strength and stability.

The four wide entrance portals open onto a lobby 18x75 ft., which in turn opens onto the auditorium floor which is 100x160 ft. There is 16,000 sq.ft. of floor space in the main hall, enough to provide ample facilities for the largest conventions wishing to come to this pleasant resort city.

Another measure of the success of this building which cannot be overlooked is the fact that since its completion I have been called upon to design four other buildings in this region, and all of them are of architectural concrete. Two of them are schools totaling $200,000. And it was during the early stages of construction of one of these buildings that an event occurred which has made me more than ever enthusiastic about concrete. While one of these schools was in construction a severe flood occurred. Had this structure been of unit type construction costly damage would have been inevitable. However, when the flood waters subsided, it was found that the concrete had suffered no damage of any kind and construction was resumed without need for replacing any existing construction or for correction of any condition caused by the flood.

It is my opinion, based on these considerable number of projects, that architectural concrete is an ideal material for public construction projects such as schools or municipal buildings. The speed with which it can be erected and the general satisfaction promoted by the excellence of the work obtained certainly justify my continuing to use concrete in future work.

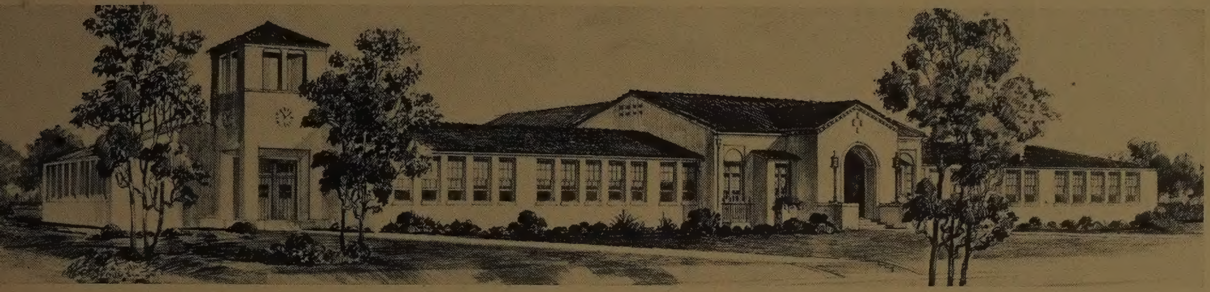
Under proper supervision and care in construction, concrete will find many uses in new fields within the next few years. As a medium of architectural expression this material has few equals, and the possibilities of ornamentation are practically unbounded.

is 84x120 ft. with 14-ft. high walls. A 17-ft. square to
dominates the structure, rising 34 ft. above grade. Conc
grilles in the tower are 3x14 ft., precast and set in pl
Ready-mixed concrete was used for the entire project wh
was finished with two coats of white portland cement pa
The interior is exposed concrete with no finish treatm

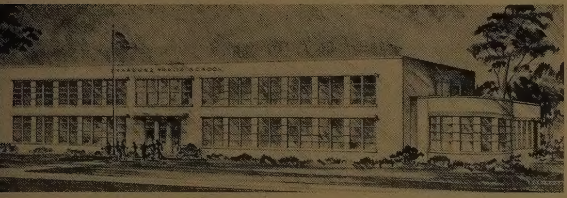
*Owner, Saginaw, Mich.

Convinced that success in modern merchandising requires a beautiful as well as a bold front, the owner of this Pure Oil and Packard Se Station at Saginaw, Mich., demanded a modern design of brilliant but dignified appearance. Then, for the sake of economy, concrete selected as the material of construction. Designed by the Pure Oil Co. offices at Chicago, it was built by Edward Wobig of Saginaw.

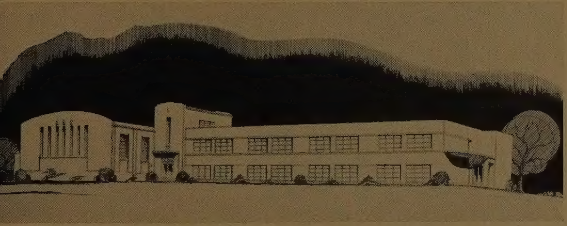
File 10-7-1 Some Designs for New Structures in ARCHITECTURAL CONCRETE



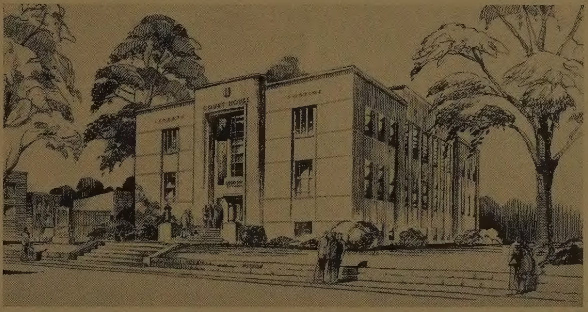
Nearing completion at Decatur, Texas, is this splendid new school. The building was designed by Arthur A. Brown of Dallas, Texas.



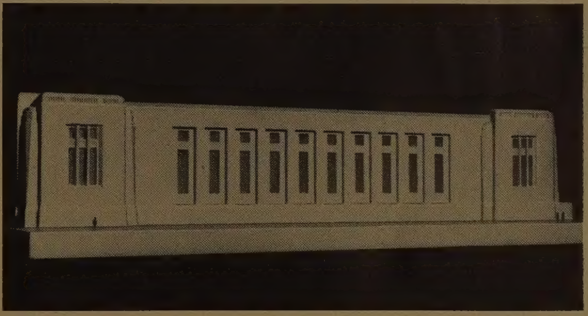
acuse, Neb., school (top) and Plattsmouth, Neb., grade school are two jects designed by N. Bruce Hazen, of Lincoln, Neb., soon to be under struction.



gh school for Utica, Ky., now under construction for Daviess County Board Education. Walter Scott Roberts, Owensboro, Ky., is the architect for this dern concrete building.

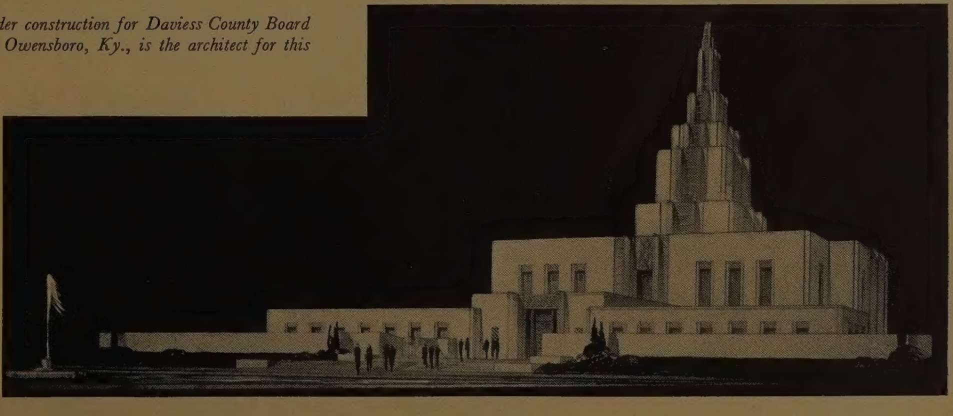


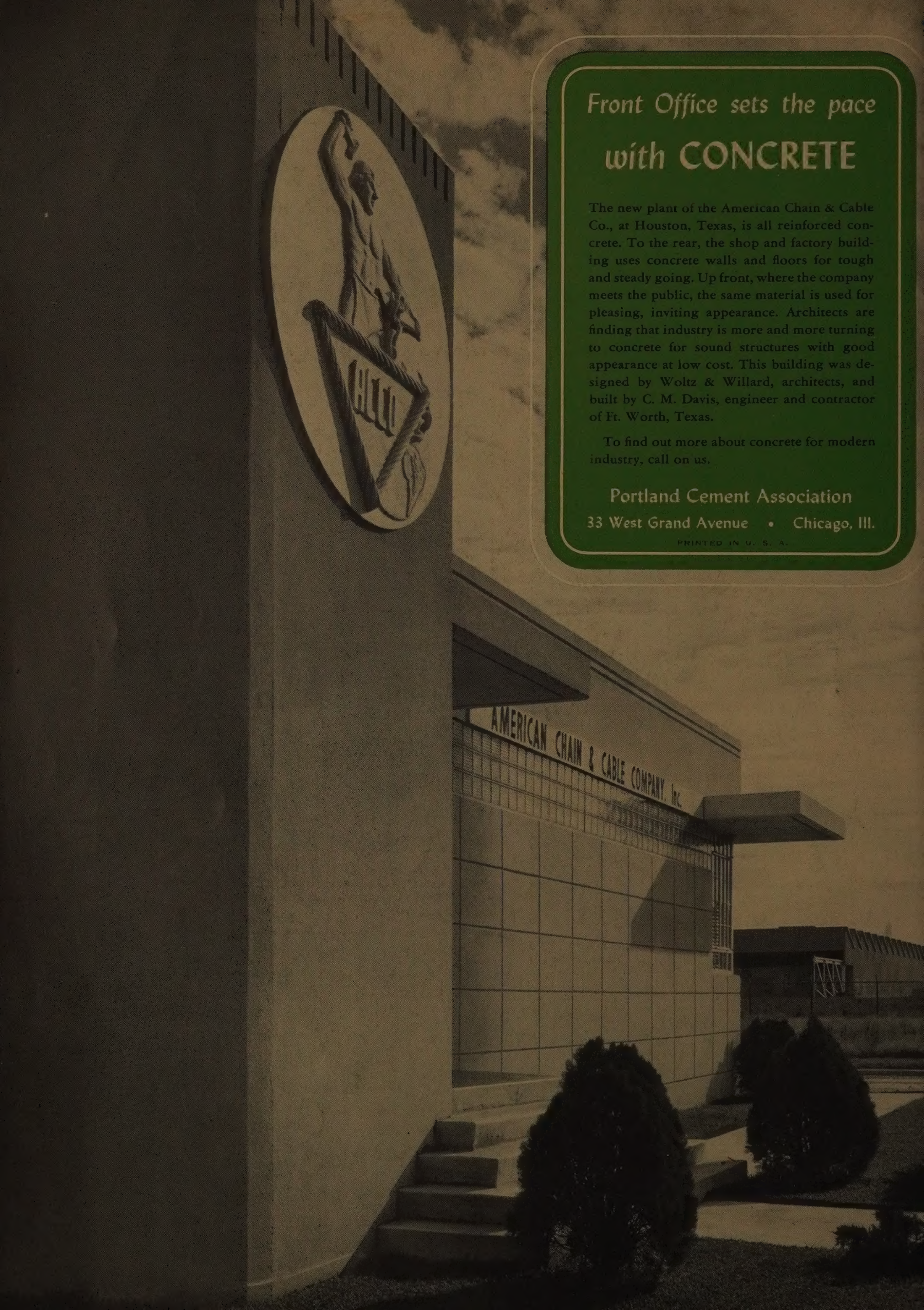
Ohio County Courthouse, at Hartford, Ky. Walter Scott Roberts is architect and Wescott & Thornton, engineers.



Model of powerhouse at Pinopolis Dam, Santee-Cooper power project, near Charleston, S. C., now under construction by Central Engineering Co., Davenport, Ia. Ralph Oliver, Chicago, architect; Harza Engineering Co., Chicago, structural engineers.

mple for the Church of Jesus rist of Latter Day Saints, aho Falls, Idaho. Designed Board of Temple Architects: Edward O. Anderson, orgius Y. Cannon, John tzer, Ramm Hansen, Hyrum be and Lorenzo S. Young. nder construction by Birdwell nlayson, Pocatello, Idaho. alls of this building are cast ne used as forms for cast-place concrete.




Front Office sets the pace
with CONCRETE
The new plant of the American Chain & Cable Co., at Houston, Texas, is all reinforced concrete. To the rear, the shop and factory building uses concrete walls and floors for tough and steady going. Up front, where the company meets the public, the same material is used for pleasing, inviting appearance. Architects are finding that industry is more and more turning to concrete for sound structures with good appearance at low cost. This building was designed by Woltz & Willard, architects, and built by C. M. Davis, engineer and contractor of Ft. Worth, Texas.
To find out more about concrete for modern industry, call on us.
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